

RESPONSE

Support

Applicants have amended claim 1 to further clarify that the compound of the present invention is prepared from a physical mixture of conventional and high vinylidene polyisobutylene (PIB) and/or a physical mixture of an alkylated hydroxyaromatic compound derived from conventional PIB and an alkylated hydroxyaromatic compound derived from high vinylidene PIB. Support for this amendment is found in the claims themselves and also on page 3, lines 25-32 and page 5, lines 29-32 of the specification.

Applicants have added new claims 17, 18 and 19, which depend on claim 1, 11, and 13 respectively. The new claims specify that the weight ratio of conventional to high vinylidene PIB used to derive the compounds of the present invention range from 25:75 to 60:40. Support for these new claims is found on page 6 lines 32 to page 7 line 3 of the specification.

No other elements of the claims have been amended.

Response

The Examiner has rejected claims 1-13 under 103(a) as being unpatentable over Malfer (US 5,725,612) in view of Kolp (US 5663457). The Examiner concedes that Malfer does not teach alpha- and beta- vinylidene groups in PIB. The Examiner also concedes that Malfer does not teach the features of the present invention with regards to the presence of conventional PIB. The Examiner is of the position that Kolp teaches this difference. The Examiner reads Kolp as teaching the use of conventional PIB in the preparation of alkylated hydroxyaromatics. The Examiner considers the combination of Malfer and Kolp to result in the present invention and/or disclose all features of the present invention. Applicants respectfully disagree.

Malfer teaches the use of high vinylidene (highly reactive) PIB in the preparation of Mannich condensation products (see the Abstract and col 3, lines 48-56 of Malfer). Kolp teaches the use of conventional PIB in place of high vinylidene PIB in the preparation of alkylated hydroxyaromatics (see col 2 lines 25-38 of Kolp). As the Examiner has conceded, there is no teaching in Malfer of using conventional PIB, let alone a combination of conventional PIB and high vinylidene PIB.

Kolp teaches the use of conventional PIB in the preparation of alkylated hydroxyaromatics. The Examiner appears to concede there is no teaching in Kolp of using high vinylidene PIB. Indeed, Kolp makes it clear that its teachings are focused on choosing an improved catalyst so that conventional PIB may be used in the alkylation

process as effectively and efficiently as high vinylidene PIB. Kolp stresses that conventional PIB is less expensive than high vinylidene PIB, and so Kolp's invention allows for the use of conventional PIB in place of high vinylidene PIB. Kolp notes that the main reason for using high vinylidene PIB is its increased reactivity, but its invention allows for the more efficient use of conventional PIB, thus removing the need to use high vinylidene PIB and saving money (see col 2, lines 39-47, especially lines 46-47, of Kolp).

In contrast the present invention deals with a Mannich reaction product derived from a physical combination of conventional PIB and high vinylidene PIB. The two types of PIB are physically mixed prior to alkylation, or conventional PIB alkylated hydroxyaromatics are mixed with high vinylidene PIB hydroxyaromatics prior to the Mannich condensation reaction. The combination of conventional PIB and high vinylidene PIB is not taught by either reference as they both make a point of focusing on and stating the benefits of one over the other, Malfer on high vinylidene PIB and Kolp on conventional PIB. Neither reference teaches the feature of combining conventional PIB and high vinylidene PIB in the preparation of Mannich reaction products. Therefore, as a feature of the present invention is not taught by the cited references, either alone or in combination, Applicants respectfully submit that the present invention is both novel and unobvious over the references, and ask that the rejections be removed.

Applicants further note that the combination of Malfer and Kolp would not result in the present invention. Malfer teaches the use of high vinylidene PIB in the preparation of Mannich reaction products. Kolp teaches an improved method of using conventional PIB in the preparation of hydroxyaromatic compounds, which may be used in Mannich reactions, eliminating the benefits of using high vinylidene PIB and allowing conventional PIB to be used instead. Therefore, the combination of Malfer and Kolp would result in the Mannich reaction products of Malfer derived from the conventional PIB hydroxyaromatics of Kolp.

In contrast the present invention specifies the use of a combination of conventional and high vinylidene PIB. Neither reference teaches such a combination or provides any motivation to use such a combination.

The Examiner states that it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose in order to form a third composition to be used for the same purpose. Applicants note that even following this premise, the resulting third compound is not a compound of the present invention. The combination the Examiner implies in this argument would be the composition of Malfer (a Mannich derived from high vinylidene PIB) combined with

the composition of Kolp (a hydroxyaromatic compounds derived from conventional PIB). As noted above, this is not a composition of the present invention, which instead is a Mannich reaction product derived from a mixture of conventional and high vinylidene PIB. No where in any of the cited references is there any indication such a mixture could be used in the preparation of a Mannich reaction product or that such a combination would be useful. Therefore, Applicants respectfully request that all rejections based on these references be removed.

Even if the Examiner continues to disagree, the Examiner appears to concede the data in the specification shows a surprising result but contends that the data provided does not allow her to ascertain if the unexpected results are obtained over the range of hydroxyaromatic compounds, aldehyde and amines claimed. Applicants respectfully disagree.

Applicants note that the critical feature of the present invention is the hydroxyaromatic compound, and specifically the PIB used to prepare the hydroxyaromatic compound. Applicants have provided data that compares samples prepared using 100% high vinylidene PIB, 100% conventional PIB, and several combinations of high vinylidene and conventional PIB, thus showing the endpoints outside of the claims as well as multiple invention examples. These results show that the compositions of the present invention, which utilize a combination of high vinylidene and conventional PIB, provide IVD performance better than one would expect given the difference in performance of the 100% conventional PIB and 100% high vinylidene PIB derived examples. Applicants submit that these results show that Mannich reaction products derived from combinations of conventional and high vinylidene PIB provide results that are not inline with expectations. There is no reason to believe that such results do not carry over to all amines and aldehydes suitable for use in Mannich reactions, and such an assumption is consistent with the prior art, including Malfer, which used formaldehyde and DMPD in every one of its inventive examples, while broadly allowing for and generally claiming aldehydes and amines. Therefore, Applicants respectfully submit that the data provided in the specification does indicate that the improved results extend over the full scope of the claims.

Finally, Applicants note that even if the Examiner is not persuaded by the arguments above, new claims 17, 18 and 19 specify the weight ratio of the PIB used in the preparation of the compounds of the present invention. If claims 1-13 are still considered to be incommensurate in scope with the data provided in the specification, a position Applicants respectfully disagree with for the reasons stated above, Applicants

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submit that claims 17, 18 and 19 should be considered commensurate in scope and so allowable..

Conclusion.

For the foregoing reasons it is submitted that the present claims are novel and non-obvious, and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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